

PENDING CLAIMS AS AMENDED

Claims 1-57. (Canceled)

58. (Previously Presented) A system for distributed packet-based paging having a plurality of access nodes configured to exchange paging information over corresponding access links, the plurality of access nodes serving a plurality of end nodes, each end node being associated with, and configured to receive a page from, at least one access node,

the system further characterized in that each of the plurality of access nodes comprises at least one of a paging requirements determination (PRD) module and a paging resource control (PRC) module,

where each PRD module determines paging requirements to send to a PRC module in communication with an intended end node of a page, the paging requirements being determined at least in part (i) from analyzing at least one of a header field and payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the PRD module resides, and

where each PRC module provides PRC functionality in accordance with the paging requirements received from the PRD module, where the PRC functionality includes controlling at least one of (i) paging resources, (ii) paging operations, and (iii) the generation of pages to an intended end node.

59. (Previously Presented) An access node for use in a system with distributed packet-based paging and characterized by a plurality of access nodes configured to exchange paging information over corresponding access links and a plurality of end nodes associated with, and configured to receive a page from, at least one access node, the access node comprising at least one of:

a paging requirements determination (PRD) module and a paging resource control (PRC) module,

the PRD module determining paging requirements to send to a PRC module in communication with an intended end node of a page, the paging requirements being determined at least in part (i) from analyzing at least one of a header field and payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the PRD module resides, and

the PRC module providing PRC functionality in accordance with the paging requirements received from the PRD module, where the PRC functionality includes controlling at least one of (i) paging resources, (ii) paging operations, and (iii) the generation of pages to an intended end node.

60. (Previously Presented) The access node of claim 59, wherein the PRD module further includes:

a monitoring agent module that determines when to initiate a page to the intended end node;

a tracking agent module that tracks the location of end nodes based on received location update signals; and

an anchor paging agent module that coordinates page request signaling to the intended node.

61. (Previously Presented) The access node of claim 59, wherein the PRC module further includes:

a local paging agent module that coordinates signaling between the PRD module and other access nodes.

62. (Previously Presented) The access node of claim 59, wherein the exchange of the paging information is based on an Internet protocol (IP).
63. (Previously Presented) The access node of claim 62, wherein the PRD module determines the paging requirements based on matching IP datagrams to specific paging requirements.
64. (Previously Presented) The access node of claim 59, wherein at least one of the determined paging requirements is indicative of a quality of service (QoS).
65. (Previously Presented) The access node of claim 64, wherein the QoS includes a page transmission timing constraint, wherein the page transmission timing constraint indicates paging latency information and specifies an upper bound on paging delay.
66. (Previously Presented) The access node of claim 64, wherein the QoS is one of a plurality of levels.
67. (Previously Presented) The access node of claim 64, wherein the QoS requires at least one of transmission of the page multiple times and retransmission of the page at least once in the absence of an acknowledgment.
68. (Previously Presented) The access node of claim 59, wherein the determined paging requirements includes determining whether a plurality of paging requests are associated as a group with a common quality of service indicator; and the PRC functionality includes allocating a fraction of paging channel capacity or paging transmission opportunities to the plurality of page requests associated with the group.
69. (Previously Presented) The access node of claim 59, wherein the determined paging requirements includes information indicating a state of device operation in which an end node to which the page is directed is to operate after receiving the page.

70. (Previously Presented) A method for communicating paging information by an access node for use in a system with distributed packet-based paging and characterized by a plurality of access nodes configured to exchange paging information over corresponding access links and a plurality of end nodes associated with, and configured to receive a page from, at least one access node, the access node comprising at least one of a paging requirements determination (PRD) module and a paging resource control (PRC) module, the method comprising:

determining, by the PRD module, paging requirements to send to a PRC module in communication with an intended end node of a page, the paging requirements being determined at least in part (i) from analyzing at least one of a header field and payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the PRD module resides, and

controlling, by the PRC module, in accordance with the paging requirements received from the PRD module, at least one of (i) paging resources, (ii) paging operations, and (iii) the generation of pages to an intended end node.

71. (Previously Presented) The method of claim 70, further comprising:

determining, by the PRD module, when to initiate a page to the intended end node;  
tracking, by the PRD module, the location of end nodes based on received location update signals; and

coordinating, by the PRD module, page request signaling to the intended end node.

72. (Previously Presented) The method of claim 70, further comprising:

coordinating signaling, by the PRC module, between the PRD module of one access node and other access nodes.

73. (Previously Presented) The method of claim 70, wherein the exchange of the paging information is based on an Internet protocol (IP).

74. (Previously Presented) The method of claim 73, wherein the determining of the paging requirements includes determining the paging requirements based on matching IP datagrams to specific paging requirements.

75. (Previously Presented) The method of claim 70, wherein the determining of the paging requirements includes determining that at least one paging requirement is indicative of a quality of service (QoS).

76. (Previously Presented) The method of claim 75, wherein the determining of the paging requirements includes determining that the QoS includes a page transmission timing constraint, wherein the page transmission timing constraint indicates paging latency information and specifies an upper bound on paging delay.

77. (Previously Presented) The method of claim 75, wherein the determining of the paging requirements includes determining that the QoS is one of a plurality of levels.

78. (Previously Presented) The method of claim 75, wherein the determining of the paging requirements includes determining that the QoS requires at least one of transmission of the page multiple times and retransmission of the page at least once in the absence of an acknowledgment.

79. (Previously Presented) The method of claim 70, wherein the determining of the paging requirements includes determining whether a plurality of paging requests are associated as a group with a common quality of service indicator; and further comprising:

allocating by the PRC module a fraction of paging channel capacity or paging transmission opportunities to the plurality of page requests associated with the group.

80. (Previously Presented) The method of claim 70, wherein the determining of the paging requirements includes determining that the paging requirements includes information indicative

of a state of device operation in which an end node to which the page is directed is to operate after receiving the page.

81. (Previously Presented) A computer program product including a computer readable medium having instructions for a processor of an access node for use in a system with distributed packet-based paging and characterized by a plurality of access nodes configured to exchange paging information over corresponding access links and a plurality of end nodes associated with, and configured to receive a page from, at least one access node, the access node comprising at least one of a paging requirements determination (PRD) module and a paging resource control (PRC) module, the instructions causing the processor to:

determine, by the PRD module, paging requirements to send to a PRC module in communication with an intended end node of a page, the paging requirements being determined at least in part (i) from analyzing at least one of a header field and payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the PRD module resides, and

control, by the PRC module, in accordance with the paging requirements received from the PRD module, at least one of (i) paging resources, (ii) paging operations, and (iii) the generation of pages to an intended end node.

82. (Previously Presented) The computer program product of claim 81, further comprising instructions for causing the processor to:

determine, by the PRD module, when to initiate the page to the intended end node;  
track, by the PRD module, the location of end nodes based on received location update signals; and  
coordinate, by the PRD module, a page request signaling to the intended end nodes.

83. (Previously Presented) The computer program product of claim 81, further comprising instructions for causing the processor to:

coordinate signaling by the PRC module between the PRD module of one access node and other access nodes.

84. (Previously Presented) The computer program product of claim 81, wherein the exchange of the paging information is based on an Internet protocol (IP).

85. (Previously Presented) The computer program product of claim 84, wherein the instructions for causing the processor to determine the paging requirements includes instructions for causing the processor to determine the paging requirements based on matching IP datagrams to specific paging requirements.

86. (Previously Presented) The computer program product of claim 81, wherein the instructions for causing the processor to determine the paging requirements includes instructions for causing the processor to determine that at least one paging requirement is indicative of a quality of service (QoS).

87. (Previously Presented) The computer program product of claim 86, wherein the instructions for causing the processor to determine the paging requirements includes instructions for causing the processor to determine that the QoS includes a page transmission timing constraint, wherein the page transmission timing constraint indicates paging latency and specifies an upper bound on paging delay.

88. (Previously Presented) The computer program product of claim 86, wherein the instructions for causing the processor to determine the paging requirements includes instructions for causing the processor to determine that the QoS is one of a plurality of levels.

89. (Previously Presented) The computer program product of claim 86, wherein the instructions for causing the processor to determine the paging requirements includes instructions for causing

the processor to determine that the QoS requires at least one of transmission of the page multiple times and retransmission of the page at least once in the absence of an acknowledgment.

90. (Previously Presented) The computer program product of claim 81, wherein the instructions for causing the processor to determine the paging requirements includes instructions for causing the processor to determine whether a plurality of paging requests are associated as a group with a common quality of service indicator; and further comprising instructions for causing the processor to allocate by the PRC module a fraction of paging channel capacity or paging transmission opportunities to the plurality of page requests associated with the group.

91. (Previously Presented) The computer program product of claim 81, wherein the instructions for causing the processor to determine the paging requirements includes instructions for causing the processor to determine that the paging requirements includes information indicative of a state of device operation in which an end node to which the page is directed is to operate after receiving the page.

92. (Previously Presented) An access node for use in a system with distributed packet-based paging and characterized by a plurality of access nodes configured to exchange paging information over corresponding access links and a plurality of end nodes associated with, and configured to receive a page from, at least one access node, the access node comprising at least one of:

first means and second means,

the first means determining paging requirements to send to a PRC module in communication with an intended end node of a page, the paging requirements being determined at least in part (i) from analyzing at least one of a header field and payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the PRD module resides, and



the second means providing PRC functionality in accordance with the paging requirements received from the PRD module, where the PRC functionality includes controlling at least one of (i) paging resources, (ii) paging operations, and (iii) the generation of pages to an intended end node.

93. (Previously Presented) The access node of claim 92, wherein the first means further includes:  
means for determining when to initiate the page to the intended end node;  
means for tracking a location of end nodes based on received location update signals; and  
means for coordinating page request signaling to the intended end node.
94. (Previously Presented) The access node of claim 92, further comprising:  
means for coordinating by the second means signaling between the first means of one access node and other access nodes.
95. (Previously Presented) The access node of claim 92, wherein the exchange of the paging information is based on an Internet protocol (IP).
96. (Previously Presented) The access node of claim 95, wherein the first means includes means for determining the paging requirement based on matching IP datagrams to specific paging requirements.
97. (Previously Presented) The access node of claim 92, wherein the first means includes means for determining that at least one paging requirement is indicative of a quality of service (QoS).
98. (Previously Presented) The access node of claim 97, wherein the QoS includes a page transmission timing constraint, wherein the page transmission timing constraint indicates paging latency information and specifies an upper bound on paging delay.

99. (Previously Presented) The access node of claim 97, wherein the QoS is one of a plurality of levels.

100. (Previously Presented) The access node of claim 97, wherein the QoS requires at least one of transmission of the page multiple times and retransmission of the page at least once in the absence of an acknowledgment.

101. (Previously Presented) The access node of claim 92, wherein the first means includes means for the determining whether a plurality of paging requests are associated as a group with a common quality of service indicator; and the second means includes means for allocating a fraction of paging channel capacity or paging transmission opportunities to the plurality of page requests associated with the group.

102. (Previously Presented) The access node of claim 92, wherein the first means includes means for determining that the paging requirements includes information indicating a state of device operation in which an end node to which the page is directed is to operate after receiving the page.

103. (Previously Presented) An end node for use in a system with distributed packet-based paging and characterized by a plurality of access nodes configured to exchange paging information over corresponding access links and a plurality of end nodes associated with, and configured to receive a page from, at least one access node, the distributed packet-based paging system further characterized in that each of the plurality of access nodes includes at least one of a paging requirements determination (PRD) module and a paging resource control (PRC) module, where each PRD module determines paging requirements to send to a PRC module currently in communication with the intended end node of the page, the paging requirements being derived at least in part (i) from analyzing at least one of a header field and payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the PRD module resides, and each PRC module provides PRC functionality in accordance with paging

requirements received from the PRD module, where the PRC functionality includes controlling at least one of (i) paging resources, (ii) paging operations, and (iii) the generation of pages to an intended end node,

the end node comprising:

means for taking a first action when receiving a first page from a first access node having a first PRC module, where the first PRC module generates the first page to the end node on the basis of a data message received by a first PRD module; and

means for taking a second action when receiving a second page, different from the first page, from a second access node having a second PRC module, where the second PRC module generates the second page on the basis of the same data message received by a second PRD module.

104. (Previously Presented) A method for receiving a page by an end node in a system with distributed packet-based paging and characterized by a plurality of access nodes configured to exchange paging information over corresponding access links and a plurality of end nodes associated with, and configured to receive the page from, at least one access node, the distributed packet-based paging system further characterized in that each of the plurality of access nodes includes at least one of a paging requirements determination (PRD) module and a paging resource control (PRC) module, where each PRD module determines paging requirements to send to a PRC module currently in communication with the intended end node of the page, the paging requirements being derived at least in part (i) from analyzing at least one of a header field and payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the PRD module resides, and each PRC module provides PRC functionality in accordance with paging requirements received from a PRD module, where the PRC functionality includes controlling at least one of (i) paging resources, (ii) paging operations, and (iii) the generation of pages to an intended end node,

the method comprising:

taking a first action when receiving a first page from a first access node having a first PRC module, where the first PRC module generates the first page to the end node on the basis of a data message received by a first PRD module; and

taking a second action when receiving a second page, different from the first page, from a second access node having a second PRC module, where the second PRC module generates the second page on the basis of the same data message received by a second PRD module.